

Community Solar for the LMI Community

Background

The Maryland State Legislature adopted Community Solar legislation (Public Utility section 7-306.2) during its 2015 session. It directed a three-year Community Solar Pilot Program covering 1.5% of the state's 2015 peak electricity demand (in MW). The Maryland Public Service Commission (PSC) adopted regulations for the program in July 2016 and subsequently approved Community Solar tariffs from the investor owned utilities in April 2017. The utilities began accepting applications for interconnection agreements and program capacity for the Pilot Program's second and third year on October 29, 2018.

Approximately 194 MW of solar capacity will be included in the Community Solar Pilot Program, split over the three years, with an approximate 77 MW, 77 MW and 39 MW, respectively.¹ These numbers are only approximate as actual capacity is assigned to each Investor Owned Utility (IOU) service area based on the actual peak demand (in MW) recorded in FY 2015.² Utilities have the option to accept project capacity that exceeds 1.5% of their maximum 2015 peak demand, but must notify the PSC.³ The Pilot Program's regulations require 30% of the solar capacity be assigned to Low to Moderate Income (LMI) projects, with 10% of the total array energy to be used only for the Low Income participants.

Of the 116,000 kW authorized in the second and third years of the Pilot Program, 34,800 kW (30%) are designated "LMI projects". Of this capacity, 10,440 kW (30%) are set aside for people who meet LMI criteria.⁴ Of this energy, 3,480 kW must be used for those that meet Low Income criteria.

While members of the LMI community are eligible to participate using either an "ownership" or a "PPA" model, most projects available to the LMI community will use a PPA model. Projects marketed to the LMI community should address their needs, which include:

- Portability: Some members of the LMI community move frequently, and therefore, the PPA contract must be portable.
- Term of Commitment: Many LMI consumers may shy away from signing long term financial commitments. As such, short term commitments may be preferable to long term commitments.
- Savings: Projects should save the LMI household money, not just at the beginning of the contract but throughout the contract.
- Knowledge: Few members of the LMI community have experience with PPA contracts and may not fully understand aspects of the PPA contract. Project marketing must aim to assure that LMI consumers are knowledgeable of key aspects of the PPA agreement that could affect them during the term of the contract.
- Qualification for the PPA: In order to gain a favorable financing rate, solar array developers must show a low financial risk, i.e. the ability to reliably pay off the loan on time. Developers often achieve this low financial risk by signing up subscribers that have a high credit score. However,

¹ <http://www.psc.state.md.us/electricity/community-solar-pilot-program-frequently-asked-questions/>

² Maryland has four major Investor Owned Utilities: Potomac Edison (covering western Maryland), PEPCO (now owned by Exelon) covering Washington DC and much of two surrounding counties, Baltimore Gas and Electric Lighting (covering the greater Baltimore Area), and Delmarva Power and Light, which covers much, but not all, of the Eastern Shore of Maryland

³ COMAR 20.62.02.A(4)

⁴ Moderate income includes Maryland residents who earn <80% of the median state income (\$xxx,000); Low income includes Maryland households who earn less than the 175% of the federal LMI rate)

many in the LMI community do not have a high enough credit score to qualify as one of these subscribers. As such, an LMI Pilot project must include a mechanism to reduce the financial risk of having subscribers without high credit scores.

Strategy

The Maryland Energy Administration's Community Solar grant programs provides incentives to support members of the LMI community's involvement through three linked efforts:

MEA is funding, and will encourage neutral third party educators to assist the LMI community to understand the pros and cons of PPAs, including pointing out the key paragraphs that impose costs and duties on the consumer (e.g., requiring consumers to contact the subscriber organization). This aspect may include development of literature for potential LMI subscribers, speaking at solar developers' sales meetings with potential LMI subscribers, and providing outreach into the community independent of the sales efforts. These third party educators are solely focused on assuring that the LMI subscriber understands key elements of the PPA agreement.

- The Maryland Energy Administration will fund the Maryland Environmental Service (MES) to run this program, including the development of the Request for Proposal (RFP) and a subsequent contract with third party educators.

MEA is providing for a method to minimize LMI Pilot project financial risk by providing grant funds to a third party guarantee of loan payment. The use of a loan guaranty fund can serve this function by providing funding to replace payments from LMI subscribers who miss, or are late on their monthly PPA energy payments. The fund will then be reimbursed by the eventual late payments from these LMI subscribers. However, subscribers who fail to make late payments may be unsubscribed and new subscribers found who will meet the monthly obligations. As such, over the life of the project, the subscriber pool should demonstrate reduced risk as unreliable subscribers are gradually replaced by reliable subscribers.

- MEA provided grant funding (up to \$1,000,000 on a reimbursable basis) to the Climate Access Fund to perform this third party guarantee function. Under its Grant Agreement with MEA, the Climate Access Fund may use available grant funds to minimize financial risks for LMI-PPA projects approved to participate in the Community Solar Pilot project for years 1, 2, or 3.

MEA Grants will offer incentives to subscriber organizations for offering PPAs that provide real value to the LMI community. These grant incentives will encourage PPA contracts with shorter terms as well as guaranteed savings throughout the life of the PPA. The rationale for encouraging these types of PPAs is provided below.

- PPA contracts will always show savings at the beginning of the contract term, but will often include a cost escalator clause to account for estimated inflation and cost escalation during the contract period. A common escalator currently in use increases the PPA cost of energy by 2.9% per year over the term of the contract; however, other options are negotiable. If the actual cost of electricity increases by less than the PPA escalator rate, the value of the savings will be diminished over time. Thus, it is possible that the PPA rate will exceed the energy rate charged by the utility. To prevent this loss of value over the life of the PPA contract, the subscriber organization could agree to

maintain a constant percentage savings throughout the life of the contract. This could be achieved by having the PPA escalator rate match the long term rate of electricity cost increase in Maryland (about 2%), or by having the subscriber organization agree to set its price as a percentage of the retail price of electricity within the subscriber's electric utility service area. The amount of the MEA grant incentive is designed to recompense the subscriber organization for taking on this inflation risk.

- Most PPA contracts will try to provide a clear value to the customer during the first year of the contract (with the value during subsequent years being controlled by the utility's electricity sales price and the PPA escalator clause, as discussed in the above paragraph). For the LMI community, MEA will incentivize savings that exceed 15% below the utility's Standard Offer Service (SOS) rate. The greater the saving, the greater the incentive.
- In FY18, MEA addressed the risk associated with a shorter term of commitment by offering an incentive for shorter term contracts. However, during this initial year of the Community Solar LMI PPA Grant Program (FY 18), MEA determined that all the grantees in this program had already intended to offer relatively short term contracts for the LMI community (Also, those grantees offering the longer terms within this group also provided low cost methods for the subscriber to break the contract before the end of term). As such, MEA is not offering this incentive as a part of the FY 20 Community Solar LMI PPA Grant Program.
- During the first two years of the Pilot Program, there was considerable discussion in the Community Solar Working Group concerning the manner to validate the eligibility of a Low and Moderate income household. In most cases, a low income household that would be eligible for federal assistance programs which used the same definition of "Low Income" as that used by the Community Solar regulations would be considered validated. However, confirming eligibility for moderate income households is more complex. Options discussed included having the subscriber organization review the moderate income subscriber's income documents (possibly including the last income tax submittal), and maintaining a copy of the income/tax documents on premises to allow for auditability by the Maryland PSC (or other Maryland agency). This approach would require additional time and resources to train individuals to carry out the review, validate each potential moderate income subscriber, and securely maintain the financial records on an ongoing basis. An alternate option discussed was hiring a third party to conduct the income validation and securely maintain the required financial records. Under this approach, the subscriber organization need only maintain documentation from the third party that the household met the moderate income criteria of the Community Solar regulations. In order to allow for third party validation, MEA is now offering an incentive as part of its FY 20 Community Solar LMI PPA Grant program to provide reimbursement for a portion of the costs for third party income validation of LMI subscribers.

Analysis:

A 2 MW (2,000 kW) array with 30% LMI subscribers would have 600 kW assigned for LMI use. While there are no limits to the number of subscribers per array, MEA will only provide incentives to conduct income verification for up to 350 potential subscribers.

LMI Validation Grant Incentive:

At least one company was found that would provide 3rd party income validation services for approximately \$30/review. Based in part on this general amount, MEA is offering a reimbursement of up to \$10,500 to a grantee for third party validation services for potential LMI subscribers. This amount was

determined based on an assumption that the grantee pays for 350 reviews at a maximum incentive reimbursement amount of \$30 per review. ($\$30 \times 350 \text{ subscribers} = \$10,500$) Any third party income validation cost above \$10,500 will be borne by the subscriber organization.

Subscription Incentive:

MEA grant funds being offered as a subscription incentive is based on the difference between the Net Present Value of the savings from a base case (which is the savings generally offered in a residential homeowners PPA) and from the proposed PPA from the Subscriber Organization which will be offered to an LMI Subscriber (the test case). The subscriber organization shall describe their time vs. cost table which shall be mapped into the Test Case model of the LMI PPA Incentive Calculator. If a step-down model is used, the time vs. cost table shall be mapped into the Step-Down Case model of the LMI PPA Incentive Calculator. (Incentive caps for step-down projects will be agreed upon on a case by case basis.)

Assume the initial utility rate for electricity is \$0.14/kWh. The base case assumes the utility escalation rate for Standard Offer Service (SOS) is 2.00%/year. The base case PPA escalation rate is 2.90%/year; and the assumed discount rate is 10%. Unlike the 20% reduction assumed for the FY18 MEA Community Solar LMI PPA Grant program, in FY 20, MEA is assuming a 15% reduction below the utility SOS rate. This produces a net present value of the savings stream for the base case of 14.159 cents per kilowatt-hour (kWh).

Consider a proposed test case that matches the base case but where the subscriber organization agrees to match the utility escalation rate (i.e. 2.00%) and the initial year discount is 25%, the NPV of the savings stream would be 47.495 cents/kWh, for a change of 23.34 cents per kWh. Assuming 600 kW-dc of the 2 MW-dc array is dedicated to the LMI community, and that the array achieves 1,250 kWh/kWp per year, the LMI portion of the array would put out 750,000 kWh/year. Based on the assumptions above, the total subscription incentive would be \$175,022 ($750,000 \text{ kWh/year} \times \$0.2334/\text{kWh} = \$175,022$).

Assumptions:

The subscriber organization shall describe their time vs. cost table which shall be mapped into the Test Case model of the LMI PPA Incentive Calculator. If a step-down model is used, the time vs. cost table shall be mapped into the Step-Down Case model of the LMI PPA Incentive Calculator.

Incentive caps for step-down projects will be agreed upon on a case by case basis.

Figure 1 provides a graphic of the residential cost of electricity to the average Maryland resident.⁵ The absolute value of electricity in 2016 was about \$0.14/kWh, but more important, the rate of growth was about 0.2868 cents per year, a rate of about 1.9%-2.0%. The period of 2007-2012 was associated with the deregulation of the electric industry in Maryland and the economic instability in general. The stable period since 2012 is increasing at \$0.252/year or about 1.8%/year. The subscription incentive will assume an increase in the Standard Offer Service (SOS) of 2%/year and an initial SOS cost of \$0.1400/kWh.

⁵ Energy Information Agency website: Average Price by State by Provider (EIA-861)
<https://www.eia.gov/electricity/data/state/>

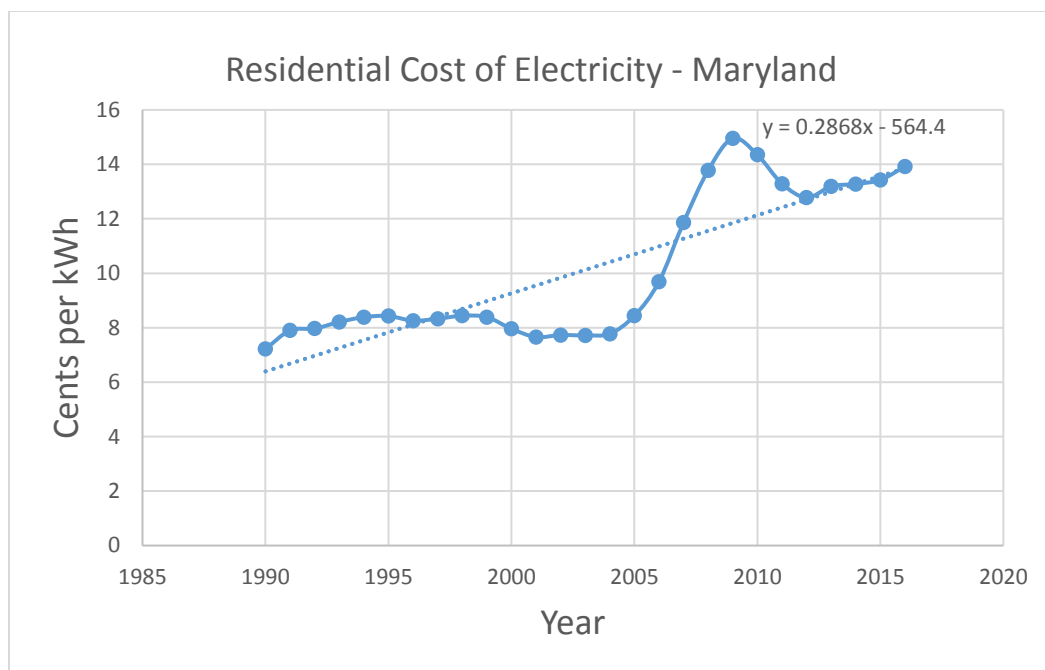


Figure 1: Residential cost of Electricity – Maryland

Normal PPA periods range between 15 and 25 years, with most in the residential sector being in the 20-year timeframe. Many Solar City example problems found on the internet use a 2.9% escalator rate. My discussion with NGOs and potential solar developers in the LMI space indicate a first year discount of 15%-20% under the SOS rate should be expected. The PPA escalator rate is normally between 1 and 5%. The actual rate can be adjusted up or down depending on the initial discount below/above the Standard Offer Service (SOS) rate provided to the consumer.⁶ For the purpose of the FY 20 model it is assumed that the **first year discount is 15% below SOS** and that a **2.9% escalator rate** is assigned by the project owner covering the **20-year period** of the PPA. This is the baseline product.

The discount rate is normally selected to account for the time value of money, and reflects the interest rate that the financier would consider reasonable to finance the project (often called the hurdle rate). A value of 10% was selected for this model. The discount rate is used when calculating net present value of streams of funding/cost, which is appropriate for calculation of the subscription incentive and the term incentive. Given that the loan loss reserve funds only insure for a given year; they are not adjusted by the discount rate.

The solar capacity factor of 1,250 kWh/kW installed is taken from PVWatts (a NREL calculator) and assumes a flat solar array in Baltimore, Maryland. It also assumes the solar system will remain on-line for the entire year (i.e. not taken off-line for maintenance). This number is reasonable.

Term of Commitment Grant Incentive:

The incentive associated with the term of commitment that MEA offered in FY 18 will NOT be offered in the FY 20 LMI-PPA Grant Program. As described above, MEA has determined that it was not needed as

⁶ In reality, the discount and escalator rates are adjusted to achieve the required internal rate of return (IRR) required of the financier.

short term periods of commitment in LMI PPAs as they were already being offered by multiple subscriber organizations.

Guaranty Grant Program:

In FY 19, the Guaranty Grant Program was amended to allow the grantee, the Climate Access Fund, to offer guarantee services to projects from Pilot Program years 1, 2 and 3. In addition, MEA authorized the Climate Access Fund to modify its strategy to best support the mission of the grant program.